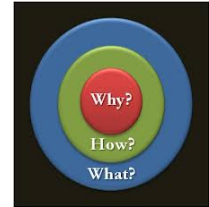


# SAVOIR Mass Memory Day 2014

TEC-ED/TEC-SW/  
ESTEC/ESOC  
14/02/2014

## SESSION 1 - GROUND AND SPACE SEGMENT REQUIREMENTS FOR FILE-BASED OPERATIONS

- a. Ground Segment considerations for file based OPS
- b. Space Segment considerations for file based solid state mass memories



## SESSION 2 - PROTOCOLS AND ONBOARD SERVICES

- a. CFDP standard updates
- b. PUS services updates



## SESSION 3 - FILE BASED MASS MEMORIES, DEVELOPMENTS AND LESSONS LEARNED

- a. Implementation aspects in relation CFDP

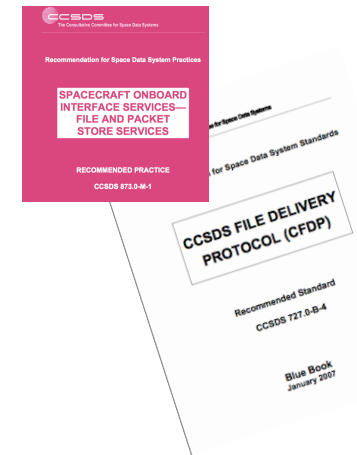


# Workshop objectives



Primary Header						Sec. Header		User Data
Version No.	Type	Sec. Hdr. Flag	APID	Seq. Flags	Packet Seq. Count	Packet Length	Stream ID	

- 1. Focus on protocols and SW services in relation to file based operations.**
- 2. Give an overview on relevant protocols, standards for onboard services and present implementations**
- 3. Discuss topics such as:**
  - a. lessons learned in relation to operations of onboard SSMMs**
  - b. pros and cons between packet store vs. file based mass memories,**
  - c. file systems considerations.**

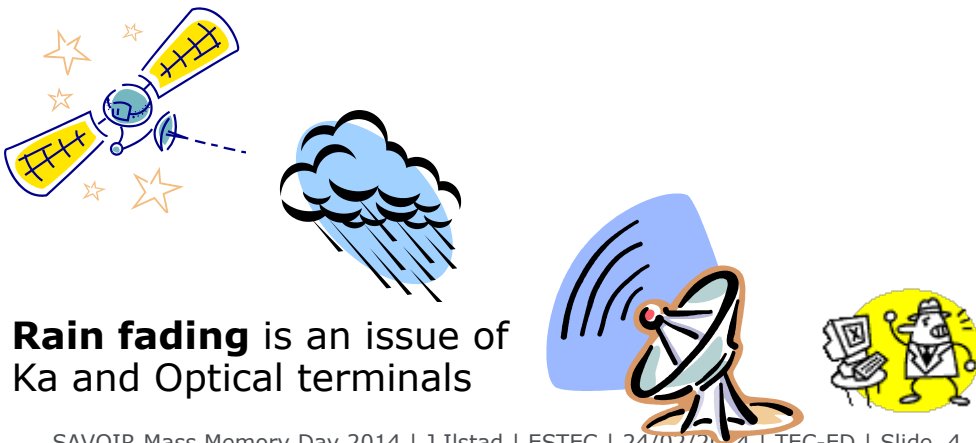


# Needs

- in relation to on-board file systems and delivery protocols



1. Optimisation and partial automation of space craft operation e.g. automated re-transmission of missing/corrupted data.
  - a. Weather sensitive down links (Ka-band or laser terminal)
2. To allow for easier prioritisation of critical on-board data
  - a. Particularly for severely restricted D/L bandwidth and/or long round trip delays
3. Cater for timely delivery of science data to end-user
4. To have a standard implementation that works for “all” missions.



**Rain fading** is an issue of Ka and Optical terminals

# Looking in to the crystal ball....

## - File uploads to payload processors

## Reconfigurable onboard payload data processors

- 1. Payload data processing** units are expected to apply reconfigurable FPGAs for certain data intensive tasks.
- 2. This allows for updated “firmware” to be applied if desired**
- 3. A full firmware file is rather large, some examples:**
  - a. Virtex4QV SX55 file size is close to **15Mbit** (uncompressed)
  - b. Virtex5QV LX130 file size is **49.3Mbit** (uncompressed)
  - c. Note! Partial bit-files can also be applied



**A file delivery protocol coupled with onboard file handling can make this easier to manage, avoiding an ad-hoc solution for every scenario.**



## Point of view of an external user:

- 1. Offer standard set of well defined communication interfaces** (SpW, MIL-STD-1553 etc.)
- 2. Offer a standard set of well defined file management services**
  - a. largely independent of the memory technology (e.g. SOIS FPSS services)
- 3. Support standard space/ground file delivery protocol (e.g. CFDP)**
- 4. Offer standard services for commanding and monitoring**



# Agenda Session 1



## GROUND AND SPACE SEGMENT REQUIREMENTS FOR FILE-BASED OPERATIONS

Time	Presentation	Presenter	Company
08:30	Welcome and Introduction	J.Ilstad	ESA/ESTEC
08:45	ADCSS 2012 conclusions and SAVOIR mass memory requirements	G.Magistrati	ESA/ESTEC
09:15	File-based operations from the OPS perspective	E.Montagnon	ESA/ESOC
09:45	CNES background, needs and views on file-based ops and protocols	P.Arberet, C. Pouliquen, P.LeMeur, B.Dellandréa	CNES CNES CNES TAS-F
<b>10:15</b>	<b>Coffee Break</b>		
10:30	Euclid Operational Considerations and Ground Segment Infrastructure	F.Keck, F.Flentge	ESA/ESOC
11:00	EUCLID: Data Handling Architecture and CFDP Tailoring	A.Tramutola	TAS-I
<b>11:30</b>	<b>End Session 1</b>		

## PROTOCOLS AND ONBOARD SERVICES

<b>11:30</b>	<b>Introduction</b>	<b>C.Taylor</b>	<b>ESA/ESTEC</b>
11:40	CFDP standard updates and SOIS file and packet store services	C.Taylor	ESA/ESTEC
12:00	PUS standard updates - file services	S.Valera	ESA/ESTEC
<b>12:30</b>	<b>Lunch 1 hour break</b>		



## **FILE BASED MASS MEMORIES – DEVELOPMENTS AND LESSONS LEARNED**

<b>13:30</b>	<b>Intro session 3</b>		
13:40	CFDP Reference and Test Facility	S.Fowell	SciSys
14:10	CFDP simulator demo	A.Valverde	ESTEC
14:30	EuclidDem - Demonstrator of the Euclid Mission File Management Service (FMS) and CCSDS File Delivery Protocol (CFDP)	S.Candia	TAS-I
14:50	HW/SW architecture implications in relation to CFDP and file system operation	T.Pike, Y.Charnet	Airbus Defense and Space
<b>17:20</b>	<b>End Session 3 15 min Break</b>		

# Agenda Round Table



	<b>TOPICS</b>		
<b>15:35</b>	Lessons Learned on SSMM OPS	E.Montagnon	ESOC
	File systems considerations for on-board SSMMs	C.Honvault	ESTEC
	File based vs. Packet Store Mass Memories	C.Taylor	ESTEC
	Topics on the spot....		
	Technology Development Roadmaps and ongoing developments	TEC-ED/TEC-SW	ESTEC
<b>16:35</b>	<b>End Of Round Table</b>		
<b>16:35-17:00</b>	<b>Wrap-up and conclusions</b>		